THE INFLUENCE OF INTELLECTUAL CAPITAL ON BANKING INDUSTRY PERFORMANCE: A CASE IN INDONESIA STOCK EXCHANGE BEFORE AND AFTER THE 2008 GLOBAL FINANCIAL CRISIS

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Abstract

The issue of Intellectual Capital is growing significantly and becoming an important research subject for accounting due to its role in determining the value and performance level of a company. Nevertheless no study has examined the performance of Intellectual Capital in two different economic conditions. The purpose of this study is to investigate the performance of Intellectual Capital in different economic conditions (monetary crisis) and its relevance to corporate performance.

This study uses the banking sector listed in Indonesia Stock Exchange between 2007 and 2009. Multiple regression method and t-test are used to analyze the data. There are several independent variables used in this study namely ROA and MB as proxies for firm and market performance. VAIC is used as a dependent variable and employed to measure intellectual capital. The study found that Intellectual Capital affects ROA but Intellectual Capital Performance of the banking industry showed no discrepancy both before and after the monetary crisis in 2008. The contribution of this study namely IC is able to become alternative measurement for company performance and a tool for investors to assess company’s performance from non-financial perspective.

Keywords: intellectual capital, economic crisis, firm performance, market performance

1. INTRODUCTION

Information technology has encouraged the development of business sector. This development leads to growing interest towards asset management practice, especially intangible assets. Intangible assets were used as guidelines for investors to evaluate companies as well as a competitive advantage (Kaplan and Norton 2004). Currently, human capital (which is another form of intangible assets) plays its importance role in Indonesia
since Indonesia’s Human Development index went up (Pasandaran 2010). Human development index is a composite index that measures a country’s average achievements in three basic aspects of human development namely life expectancy, income indices, and education. This index is published by United Nations Development Programme. The purpose of this index is to convince the public and policy-makers that they can and should evaluate country development not only by economic growth but also improvements in human well-being.

Intellectual Capital (IC) is one of many approaches used in the assessment and measurement of an intangible asset. Petty and Guthrie (2000) suggested that IC has been the focus of attention in various fields of sociology, information technology, management, and accounting. According to Petty and Guthrie (2000), this development, was triggered by the revolution of information technology, the emergence of information and network society, and innovation as a means to compete.

The issue of IC is growing significantly and becoming an important research subject for accounting due to its role in determining the value and performance level of a company. Edvinsson (2000) explained how IC became important and interesting subject for investigation. It involved several topics surrounding IC, such as perspective, alternative measurement, disclosure, impact on market and financial performance, and means of gaining competitive advantage. An interesting piece of information from Edvinsson states about the emergence of IC in some countries, not only in the developed but also in the developing countries. Kaplan and Norton (2004) stated that the role of intangible assets in the learning and growth is an essential factor for any organization to achieve its profit and turnover. Klaila and Hall (2000) suggested that good management in intellectual assets is a strategy that will bring success for the company’s future. This proves that the role of IC is very important and is worth further investigation.

Previous studies (Zhang et al. 2006; Wang 2008; Tan et al. 2007; Ulum et al. 2008; Solikhan and Roman 2010; Clarke et al. 2010; Soewarno 2011) discovered an association between IC and company performance. Company performance is affected by the economic condition of the country where the company is located. The economic crisis that occurred in 1997/1998 had a negative impact on the sectors. Several companies listed in stock exchanges have negative equities. The example proves that economic crisis brings negative impact towards company performance. The Asia regional crisis occurred in 1997/1998 was not caused due to economic factors but it was caused more by political factors and therefore led to a severe national crisis (a special case for Indonesia). With the Global Financial Crisis occurred in America has became a domino effect that led to the bankruptcy of financial institutions. The crisis then spread to Asia, including Indonesia.

Research on IC in Indonesia is still quite rare (ULUM 2009), therefore the study of IC in Indonesia becomes a challenge for researchers, especially accounting researchers. This research will not only contribute to Indonesia but also to developing nations since there is even less amount of similar research in these nations. Many latest literatures are used in this research so that this research is most up-to-date in terms of IC. Moreover, research on the correlation between IC and monetary crisis has never been conducted. Therefore, the purpose of this study is to investigate the performance of IC in different economic condition (monetary crisis) and its relevance to corporate performance.
2. LITERATURE REVIEW

In Indonesia researches on IC are still few. It can be seen from the number of IC topics presented at the National Symposium for Accounting which amounts to mere 8 researches between 1997 and 2010. Previous studies related to the effects of IC on company performance or market performances have been done but the results are still inconclusive, for example Solikhah and Roman (2010), Clarke et al. (2010), Soewarno (2011), Kuryanto and Syafrudin (2008) and Yuniasih et al. (2010).

This study uses the Resource-Based Theory (RBT) which is based on strategic management and company’s competitive advantage where it believes that a company will achieve competitive advantage when it possesses superior resources (Collins and Montgomery 2005). RBT companies will gain competitive advantage and optimal performance by acquiring, combining, and using vital assets to gain competitive advantage and optimal performance (Wernerfelt 1984). These assets include both tangible and intangible assets.

Kaplan and Norton (2001) stated that companies which can focus on strategy will acquire, unite, and develop employees (intangible assets) for the strategy of the organization since employees will implement the strategy. This is confirmed by Belkaoui (2003) which states that the incorporation of tangible and intangible assets is a potential strategy to improve the company’s performance.

Zhang et al. (2006) found that IC affects the performance of companies (ROA). Meanwhile, Wang (2008) found that IC affects market value. The research was supported by Tan et al. (2007) who found that IC is correlated with company performance and future performance as measured by ROE, ASR, and EPS. Ulum et al. (2008) studied IC by using the company’s financial performance as performance variables and concluded that IC has a positive effect on corporate financial performance (ROA) and affects the company's performance in the future (one year after). Solikhah and Roman (2010) support the previous research which states that IC affects company performance and growth. Clarke et al. (2010) found that IC affects the performance of the company's ROE and ROA and influence future corporate performance (one year after). Soewarno (2011) used ROA and MB to find that IC was positively related to organizational performance. This study shows that the company has the ability to transform the IC into a product or service that has a high added value, according to Kaplan and Norton (2004).

Nevertheless, Kuryanto and Syafrudin (2008) find different conclusion by using market’s indicator as a measure of company’s performance. They find that IC performance had no effect on company performance as measured by ROA, EPS and ASR. Subsequent research by Solikhah and Rohman (2010) that combines two of the financial performance and market performance to strengthen research conducted by Ulum (2008) and Kuryanto and Syafrudin (2008), found that performance of IC affects firm’s financial performance (CR, ATO, DER, ROI, and ROE) but has no effect on market performance (PBV and PER). The research was supported by Yuniasih et al. (2010) which states that IC does not affect market performance (PBV). Research in Indonesia by Soewarno (2011) reinforces this research by stating that IC has no effect on the ATO.
Research on the correlation between IC and company’s performance is inconclusive especially if it associated with market performance. One of the factors that determine a company's performance is economic factors and it is very interesting that until now there are no studies that investigate the performance of IC during crisis and post-crisis conditions. The research of IC in economic conditions is very important because it investigates the consistency of the relation between IC and corporate performance in different economic conditions.

3. HYPOTHESIS

Research conducted by Ulum (2008), Solikhah and Rohman (2010), Clarke et al. (2010), Zhang et al. (2006), and Tan (2007) find that IC affects company performance. Stable economic conditions or crisis will impact the company's performance; and therefore, there is a positive correlation between IC and company performance. Thus, the first hypothesis of this study is:

**H1: There was a difference in IC before and after the monetary crisis in 2008.**

Research in Indonesia conducted by Ulum (2008) and Solikhah and Roman (2010) using data before the economic crisis in 2008 showed that there is a correlation between IC performance and company performance. Meanwhile, Soewarno (2011) found that the performance of IC does not have a significant correlation with firm performance for the year of 2009. Therefore the second research hypothesis is as follows:

**H2: There was a difference in the impacts of IC on corporate performance before and after the monetary crisis in 2008.**

4. RESEARCH METHOD

This study uses quantitative approach and analyzes the relationship between the two variables: IC performance and company performance before and after the economic crisis in 2008. Quantitative approach was chosen because it can be used to resolve the problem by examining the relationship between IC and company performance variables.

4.1. Population and Sample

Firer and Williams (2003) stated that banking is an industry that has the most intensive intellectual capital since banking industry is an industry that is based on high intellectual and information technology. Innovation in products and services is a crucial factor in the success of a banking business. Kubo and Saka (2002) stated that bank employees are the most homogeneous employees compared to other industries and that banking sector is highly regulated industry.

This study uses all banking sector listed in Indonesia Stock Exchange in the period between 2007 and 2009. Selection of study sample was based on purposive sampling method with several criteria such as being listed in Indonesia Stock Exchange and providing an annual report from 2007 to 2009 as well as gaining profits and intellectual capital and not having negative equity.
4.2. Definition and Measurement of Variables

This study uses three types of variables: the dependent variable, independent variables and control variables. The dependent variable is the company's financial performance variables namely ROA and MB. ROA is the ratio between net income divided by book value of total assets. MB is the total market capitalization, obtained from price per share multiplied by shares outstanding and then divided by total assets.

The independent variables are calculated through a model IC Pulic (1999) namely VAIC™. There are two control variables used in this study namely firm size and leverage. Company size is measured by natural log of market capitalization, while leverage is measured by debt to total assets ratio.

4.3. Methodology

The methods used to analyze data are multiple regression and t-test. The models of the study are as follows:

To answer the first hypothesis, the IC variables are measured by using Pulic model (1999) namely the Value Added Intellelgent Coefficient (VAIC™) as follows:

\[ \text{VAIC™} = \text{VACA} + \text{VAHU} + \text{STVA} \]  
where:  
VACA= \text{Value Added Capital Employed}  
VAHU= \text{Value Added Human Capital}  
STVA= \text{Structural Capital Value Added}

To answer the second hypoteseis, the equation is as follows:

\[ \text{ROA} = \alpha + \beta_1 \text{VAIC} + \beta_2 \text{Size} + \beta_3 \text{Lev} + e \]  
\[ \text{MB} = \alpha + \beta_1 \text{VAIC} + \beta_2 \text{Size} + \beta_3 \text{Lev} + e \]

Where:  
ROA = \text{Return on Assets}  
MB = \text{Market to book value}  
VAIC = \text{Indeks Intellectual Capital}  
Size = \text{companies size}  
Leverage = \text{debt compare to assets ratio}

5. RESULTS

Hypothesis Testing 1

To compare the performance differences between VAIC before and after economic crisis in 2008, this study uses ANOVA. The results show that VAIC before and after the economic crisis in 2008 are respectively 6.011 and 5.646, while the P value is 0.655. Since P
value is >0.05, it means there is no difference in VAIC performance before and after the economic crisis in 2008. Thus, the first hypothesis can not reject H0.

**Hypothesis Testing 2**

To test the second hypothesis, this study uses four multiple regression models. Multiple regression models is used to see the effect of VAIC on ROA and MB both before and after the monetary crisis in 2008.

The results of the first regression on Figure 1 show that the VAIC, which is an index intellectual capital, influences ROA with a significance of less than 5% for F-test and less than 5% for t-test. Thus this is a proof that the VAIC (Intellectual Capital) has positive and significant impacts on ROA. Equation 1 can be written as:

\[
ROA = 0.271 \text{VAIC} + 0.587 \text{SIZE} - 0.401 \text{LEV} + e. \quad \text{……………… (1)}
\]

The results of the regression 2 on Figure 2 shows that IC had no effect on the dependent variable, ROA. It showed that both F test and t-test are significantly greater than 5%. Thus, it does not prove that the IC has positive and significant impacts on ROA. Equation 2 can be written as:

\[
ROA = -0.92 \text{VAIC} - 0.111 \text{SIZE} + 0.78 \text{LEV} + e. \quad \text{……………… (2)}
\]

The third regression on Figure 3 results indicate that IC had no effect on the dependent variable, MB. It showed that the significance of the F test is less than 5% and more than 5% for the t test. Thus, it does not prove that the IC has positive and significant impacts on MB. Equation 3 can be written as:

\[
MB = 0.37 \text{VAIC} + 0.359 \text{SIZE} - 0.694 \text{LEV} + e. \quad \text{……………… (3)}
\]

The results of fourth regression on Figure 4 showed that IC had no effect on the dependent variable, MB. It showed that the significance of the F test is less than 5% and more than 5% for the t test. Thus, it does not prove that VAIC has positive and significant effects on the MB. Equation 4 can be written as:

\[
MB = -0.9 \text{VAIC} + 0.572 \text{SIZE} - 0.370 \text{LEV} + e. \quad \text{……………… (4)}
\]

6. **DISCUSSION**

**Hypothesis 1**

The first hypothesis stated that there are differences in the IC before and after the monetary crisis in 2008 was not proven. There was no difference in IC performance before and after the monetary crisis in 2008. There were two events that might have affected the economy of Indonesia. The first event was the general election in 2009 which preparations were done several years earlier. The impact of uncertain election was likely to cause companies to focus on the internal safety of the company and banking industry was likely to further increase their prudence in business. The companies’ performance of post-financial crisis, in this case the banking industry, was likely focused on improving its internal quality. Therefore, they were not too aggressive. This was understandable since the crisis that occurred in the United States was triggered by large financial institutions.

The next event was the impacts of the U.S. economic crisis on Indonesia. These two events led to the decline in consumer purchasing power that naturally affected the industry in Indonesia. In such condition, companies implemented certain competitive strategy and policy
Radianto, The Influence Of Intellectual Capital On Banking Industry Performance: .......

in order to gain sustainability. These companies’ action brought impact on banking sector which was the intermediary institutions of the economy.

Hypothesis 2

Hypothesis 2 stated that there is a difference in the influence of IC on ROA and MB before and after the monetary crisis in 2008. The result showed that there is a difference in the influence of IC on ROA before and after the monetary crisis in 2008. Nevertheless, there is no difference in the influence of IC on MB before and after the monetary crisis in 2008.

VAIC brings a significant effect on ROA before the monetary crisis but gives no significant effect on ROA after the monetary crisis. The influence of VAIC on ROA declined from 2006 to 2007 until after crisis. Finally, in post-crisis, VAIC did not significantly affect the ROA. This was most likely because the monetary crisis had been gradually felt since the previous year and world economic condition in general was not so good. The growth of the world oil prices continued to increase and exceeded U.S. $ 145 per barrel. Moreover, food commodity prices also continued to increase and provided the threat of stagflation, a condition in which economic growth is very slow but then followed by high inflation (Kadin 2008).

This finding, which showed that IC had no effect on company performance, supports the research conducted by Soewarno (2011). She discovered that the bad economic condition in 2009 affected companies’ performances. The general election in 2009 and the impact of the recession that occurred in America resulted in low purchasing power and producers/companies attempted to survive during the bad economic condition. This condition affected the banking industries as intermediary function in the economy. Therefore, companies used IC for internal usage, such as to improve efficiency and to reduce cost production in order to increase their profit. Apparently, IC application in the companies in terms of innovation effort such as promotion in order to increase sales was not the focus of the companies. This study finds that there were 16 banks that had their ROA decreased between 2007 and 2009. These conditions certainly described how unprofitable the condition of the banking industry was.

On the contrary, there were no significant differences in the influence of VAIC on MB before and after the monetary crisis. In this case, the market to book value (MB) is a representation of the company's market value. This study does not support Lely (2011), Wang (2006), Bornerman and Leitner (2002) and Roslender and Fincham (2001). These previous researches used the data across the industry. Also, according to Tan et al. (2007), the contribution of IC is different among the types of industry. This study only uses the banking industry and not other industries. However, this study supports several studies which claim that IC did not affect the company's market value such as Solikhan and Rohman (2010), Yuniarsih et al. (2010), and Kuryanto and Syafrudin (2008), while Artinah and Muslih (2011) found that IC had no effect on capital gains. All the studies took place in Indonesia and presumably the theory is still applicable nowadays. It is an interesting finding to know that most researches which used the case of Indonesia found that VAIC produced no effect on market value.

In this study, the period between 2006 and 2010 (except for 2008), shows that some banks such as BRI, Bank Panin, Bank Bukopin, Bank Artha Graha International, Bank Bumi
Putera Indonesia, Bank Mayapada, Bank Bumi Artha, and Bank Capital Indonesia experienced a decline in the ratio of market to book value. Several banks suffered from fluctuation of their market to book ratio and the rest had an increase in their market to book ratio. Banks that had fluctuation in their market to book ratio were Bank Niaga, Bank Danamon, Bank Permata, Bank NISP, Bank Victoria International, Bank Nusantara Parahyangan, Agroniaga Bank, Bank Windu Kentjana, and Civil Society Bank. As explained before, the 2009 election started the preparation a few years earlier. The condition encouraged the business world to conduct internal business process improvement strategy instead of aggressive strategies.

Global capital market developments had an impact on the decline of capital markets’ performance in Indonesia, especially in 2008 when the Dow Jones index continued to weaken (Kadin 2008). This was probably one of the causes of the lack of influence of VAIC before, during, and after the monetary crisis. This condition was reinforced by information received from Bank Indonesia that monetary state after 2005 would be slower than the one in 2004 (Bank Indonesia 2005). The increase of oil prices and inflation pressures caused slow economic growth. From the standpoint of Resource-based view, even though intangible asset is a strategic asset to improve the ability to compete, this study proves that the banking company has not been using IC optimally to improve performance. In this period the banking industry were only using intangible assets to manage the internal business aspects instead of increasing the market share and market value of the company.

7. CONCLUSION, LIMITATION AND IMPLICATION

The results of this study provide us with the following conclusions:
1. IC Performance of the banking industry did not show any discrepancy before and after the monetary crisis in 2008.
2. IC affects Company performance (ROA) before the monetary crisis but gives no effect on company performance (ROA) after the monetary crisis.
3. IC does not affect Market Performance (MB), both before and after the monetary crisis.

The result of this study has several limitations, including the following restrictions:
1. This study uses a short period of two years before the crisis and two years after the crisis. It is close to impossible for companies to recover their performance within two years time. Consequently, it is difficult to measure post-crisis recovery within two years.
2. This study uses limited research variables to measure corporate performance and market performance by only using ROA and MB.
3. In accordance to the findings of Tan et al. (2007) which stated that the performance of the IC industry is different from one industry to another, it can be safely said that this study can not be generalized for all industries in Indonesia.

The research implication is that IC is able to function as alternative measurement for company performance, or in this case ROA. However, IC cannot be used to measure company market performance, or in this case MB. IC is an alternative means for investors to measure company performance from non-financial perspective. Therefore, investors should
be able to assess company performance in comprehensive evaluation namely financial and non-financial aspects.

However, research on the role of ICs within company performance is still a very interesting issue because it is a new method that works as an alternative way of measuring the performance of a company. Intangible asset has become a very important asset for the company. It becomes very strategic tool for an organization to achieve competitive advantage.

The development of creative industries requires company performance measurement to evolve in order to fit the needs. It is difficult to measure creative industries since it consists of knowledge-based assets. Therefore, traditional performance measurement which often focuses on financial and tangible assets will be difficult to implement.

This study gives valuable feedback to the authority body, such as Indonesia Capital Market Supervisory Agency and Indonesia Stock Exchange, in term of non-financial measurement method to value company’s performance. Indonesia Capital Market Supervisory Agency and Indonesia Stock Exchange may request the company listed on the Stock Exchange to disclose information about intangible asset to investors. The following are suggestions made for future research:
1. Longer time period of measurement to correctly investigate the influence of VAIC on company performance.
2. The use of other variables in corporate and market performances.
3. Application of other methods for IC measurement, such as The Value Explorer (Andriessen). This method seems to be more suitable for the banking industry since it uses the five intangible assets such as assets, skills, collective values, technology, and management processes.

REFERENCES


Soewarno, L. “Pengaruh Intellectual Capital Terhadap Kinerja Keuangan dengan Ukuran, Jenis Industri, dan Leverage Sebagai Variabel Moderating.”, 2011, research will be published.
### Figure 1. Regression 1 (ROA year 2006 – 2007)

#### Model Summary

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<th>Adjusted R Square</th>
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#### ANOVA

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#### Coefficient

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a. Predictors: (Constant), LEV, VAIC, SIZE
b. Dependent Variable: ROA

### Figure 2. Regression 2 (ROA year 2009-2010)

#### Model Summary

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a. Predictors: (Constant), LEV, VAIC, SIZE
b. Dependent Variable: ROA
**Figure 3. Regression 3 (MB year 2006-2007)**

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**ANOVA**

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**Coefficient**

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a. Predictors: (Constant), LEV, SIZE, VAIC  
b. Dependent Variable: MB

**Figure 4. Regression 4 (MB year 2009-2010)**

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<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adj R Square</th>
<th>Std Error of Estimate</th>
<th>Durbin-Watson</th>
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<td>.495</td>
<td>.466</td>
<td>.0937031</td>
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**ANOVA**

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<th>Model</th>
<th>Sum of Squares</th>
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<th>Mean Square</th>
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<th>Sig.</th>
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<td>Total</td>
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**Coefficient**

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<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
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<td>B</td>
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<td>Beta</td>
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<td>.359</td>
<td>.790</td>
<td>.433</td>
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<tr>
<td>VAIC</td>
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<td>-.090</td>
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<td>.336</td>
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a. Predictors: (Constant), LEV, VAIC, SIZE  
b. Dependent Variable: MB